WHAT IS CLAIMED IS:

1. A recording medium, wherein the medium has description of identification information indicating that a laser pulse control parameter for performing continuous recording in which recording linear velocity is changed successively or stepwise is described on the recording medium.

2. A recording medium on which information is recorded by applying a laser pulse to form a mark on a recording layer,

wherein identification information is recorded to indicate that a plurality of control parameter groups are recorded which have the laser pulse power level changing timing substantially proportional to the recording velocity for recording a mark of length not smaller than the laser spot diameter in the recording layer.

3. A recording medium on which information is recorded by applying a laser pulse to form a mark on a recording layer,

wherein identification information is recorded to indicate that a plurality of control parameter groups are recorded which have the laser pulse power level changing timing substantially proportional to the recording velocity for recording a mark of 6T or above when the clock cycle of the recorded information is T.

4. A recording medium as claimed in claim 2 or 3,

wherein the control parameter group is such a group that among the laser pulse power level change timings, the laser pulse front edge or the rear edge change timing is substantially proportional to the recording velocity.

5. A recording medium on which information is recorded by applying a laser pulse to form a mark on a recording layer,

the recording medium containing control parameters recorded for respective linear velocities decided by:

a step of recording a first mark having a length not smaller than the laser spot diameter in the recording layer at a first linear velocity;

a step of recording a second mark having a length equivalent to the first mark at a second linear velocity;

a step of calculating a voltage value change amount at two points at a distance Ts (Ts < Tm/2) in the time axis direction before and after the time position reference Tm/2 from the front edge of an electric signal waveform obtained by reproducing the first or the second mark at a predetermined linear velocity and having a time width Tm; and

a step of deciding a control parameter of the laser pulse power level change timing so that the aforementioned change amount is substantially constant during recording at any of the linear velocities.

6. A recording medium on which information is recorded by applying a laser pulse to form a mark on a recording layer,

the recording medium containing control parameters recorded for respective linear velocities decided by:

a step of recording a first mark 6T or above when T is the clock cycle of the information recorded, at a first linear velocity;

a step of recording a second mark having a length equivalent to the first mark at a second linear velocity;

a step of calculating a voltage value change amount at two points at a distance Ts (Ts < Tm/2) in the time axis direction before and after the time position reference Tm/2 from the front edge of an electric signal waveform obtained by reproducing the first or the second mark at a predetermined linear velocity and having a time width Tm; and

a step of deciding a control parameter of the laser pulse power level change timing so that the aforementioned change amount is substantially constant during recording at any of the linear velocities.

7. A recording medium on which information is recorded by applying a laser pulse to form a mark on a recording layer,

the recording medium containing control parameters recorded for respective linear velocities

decided by:

a step of recording a first mark having a length not smaller than the laser spot diameter in the recording layer at a first linear velocity;

a step of recording a second mark having a length equivalent to the first mark at a second linear velocity;

a step of calculating an average value of the voltage values during an interval Ts (Ts < Tm/2) in the time axis direction before and after the time position reference Tm/2 from the front edge of an electric signal waveform obtained by reproducing the first or the second mark at a predetermined linear velocity and having a time width Tm; and

a step of deciding a control parameter of the laser pulse power level change timing so that the aforementioned average value is substantially constant during recording at any of the linear velocities.

8. A recording medium as claimed in any one of claims 5 to 7, wherein:

a control parameter corresponding to a third linear velocity which is faster than the first linear velocity and slower than the second linear velocity is further recorded, and

the control parameter corresponding to the third linear velocity is a control parameter obtained by linear interpolation of the control parameter corresponding to the first linear velocity and the

control parameter corresponding to the second linear velocity.

9. A recording medium as claimed in claim 8, wherein the control parameter corresponding to the third linear velocity is a control parameter obtained by calculating a voltage value change amount at two points at a distance Ts (Ts < Tm/2) in the time axis direction before and after the time position reference Tm/2 from the front edge of an electric signal waveform having a time width Tm obtained by reproducing at a predetermined linear velocity a third mark having a length equivalent to the first mark which third mark has been recorded at a third linear velocity by the control parameter obtained by linear interpolation of the control parameter corresponding to the first linear velocity and the control parameter corresponding to the second linear velocity, and confirming that the change amount is substantially constant during recording at any of the linear velocities.

10. A recording medium as claimed in claim 8, wherein the control parameter corresponding to the third linear velocity is obtained by recording the third mark having a length equivalent to the first mark at the third linear velocity by the control parameter obtained by linear interpolation of the control parameter corresponding to the first linear velocity and the control parameter corresponding to the second linear velocity and by confirming that the reproduction

jitter or reproduction waveform asymmetry obtained when the third mark is reproduced has a predetermined quality.

11. A recording medium as claimed in any one of claims 5 to 7, wherein:

a control parameter corresponding to a third linear velocity which is faster than the first linear velocity and slower than the second linear velocity is further recorded, and

the control parameter corresponding to the third linear velocity is a control parameter obtained by linear interpolation of the value of the control parameter corresponding to the first velocity normalized by the recording clock cycle at the first linear velocity and the value of the control parameter corresponding to the second velocity normalized by the recording clock cycle at the second linear velocity.

12. A recording medium as claimed in any one of claims 5 to 7, wherein identification information which ndicates the control parameter group decided by the decision step is recorded.

13. An optical disk apparatus comprising a laser for applying a laser beam onto an optical disk, laser control means for controlling the laser, and rotation drive means for driving the optical disk to rotate, so that a laser pulse is applied onto a recording layer of the optical disk to form a mark, thereby recording information on the optical disk,

wherein the laser control means changes recording linear velocity successively or stepwise for continuous recording by using such a control parameter that a change timing of the power level of the laser pulse for recording a mark having a length not smaller than the laser spot diameter in the recording layer is substantially proportional to the recording linear velocity.

14. An optical disk apparatus comprising a laser for applying a laser beam onto an optical disk, laser control means for controlling the laser, and rotation drive means for driving the optical disk to rotate, so that a laser pulse is applied onto a recording layer of the optical disk to form a mark, thereby recording information on the optical disk,

wherein the laser control means changes recording linear velocity successively or stepwise for continuous recording by using such a control parameter that a change timing of the power level of the laser pulse for recording a mark of 6T or above, when T is a clock cycle of information recorded, is substantially proportional to the recording linear velocity.

15. An optical disk apparatus as claimed in claim 13 or 14, wherein the control parameter is such a control parameter that the change timing of the front edge or the rear edge of the laser pulse in the laser pulse power level change timings is substantially proportional to the recording linear velocity.

16. An optical disk apparatus comprising a laser for applying a laser beam onto an optical disk, laser control means for controlling the laser, and rotation drive means for driving the optical disk to rotate, so that a laser pulse is applied onto a recording layer of the optical disk to form a mark, thereby recording information on the optical disk,

wherein continuous recording in which the recording linear velocity changes successively or stepwise is performed by using control parameters for respective linear velocities decided by:

a step of recording a first mark having a length not smaller than the laser spot diameter in the recording layer at a first linear velocity;

a step of recording a second mark having a length equivalent to the first mark at a second linear velocity;

a step of calculating a voltage value change amount at two points at a distance Ts ($Ts < Tm/2$) in the time axis direction before and after the time position reference $Tm/2$ from the front edge of an electric signal waveform obtained by reproducing the first or the second mark at a predetermined linear velocity and having a time width Tm; and

a step of deciding a control parameter of the laser pulse power level change timing so that the aforementioned change amount is substantially constant during recording at any of the linear velocities.

17. An optical disk apparatus comprising a laser for applying a laser beam onto an optical disk, laser control means for controlling the laser, and rotation drive means for driving the optical disk to rotate, so that a laser pulse is applied onto a recording layer of the optical disk to form a mark, thereby recording information on the optical disk,

wherein continuous recording in which the recording linear velocity changes successively or stepwise is performed by using control parameters for respective linear velocities decided by:

a step of recording a first mark 6T or above when T is the clock cycle of the information recorded, at a first linear velocity;

a step of recording a second mark having a length equivalent to the first mark at a second linear velocity;

a step of calculating a voltage value change amount at two points at a distance Ts ($Ts < Tm/2$) in the time axis direction before and after the time position reference $Tm/2$ from the front edge of an electric signal waveform obtained by reproducing the first or the second mark at a predetermined linear velocity and having a time width Tm; and

a step of deciding a control parameter of the laser pulse power level change timing so that the aforementioned change amount is substantially constant during recording at any of the linear velocities.

18. An optical disk apparatus as claimed in claim 16 or 17,

wherein a step of deciding a control parameter corresponding to a third linear velocity faster than the first linear velocity and slower than the second linear velocity is further provided, and

the control parameter corresponding to the third linear velocity is a control parameter obtained by calculating a voltage value change amount at two points at a distance Ts ($Ts < Tm/2$) in the time axis direction before and after the time position reference $Tm/2$ from the front edge of an electric signal waveform having a time width Tm obtained by reproducing at a predetermined linear velocity a third mark having a length equivalent to the first mark which third mark has been recorded at a third linear velocity by the control parameter obtained by linear interpolation of the control parameter corresponding to the first linear velocity and the control parameter corresponding to the second linear velocity, and confirming that the change amount is substantially constant during recording at any of the linear velocities.

19. An optical disk apparatus as claimed in claim 16 or 17,

wherein a step of deciding a control parameter corresponding to a third linear velocity faster than the first linear velocity and slower than the second linear velocity is further provided, and

the control parameter corresponding to the third linear velocity is obtained by recording the third mark having a length equivalent to the first mark at the third linear velocity by the control parameter obtained by linear interpolation of the control parameter corresponding to the first linear velocity and the control parameter corresponding to the second linear velocity and by confirming that the reproduction jitter or reproduction waveform asymmetry obtained when the third mark is reproduced has a predetermined quality.

20. An optical disk apparatus as claimed in any one of claims 13, 14, 16 and 17, the apparatus further comprising judgment means for judging whether continuous recording using the control parameter for changing the recording velocity successively or stepwise is possible before performing the continuous recording.

21. A writing method for recording information on an optical disk by applying a laser pulse on a recording layer of the optical disk so as to form a mark,

wherein recording linear velocity is changed successively or stepwise for continuous recording by using such a control parameter that a change timing of the power level of the laser pulse for recording a mark having a length not smaller than the laser spot diameter in the recording layer is substantially

proportional to the recording linear velocity.

22. A writing method for recording information on an optical disk by applying a laser pulse on a recording layer of the optical disk so as to form a mark,

wherein the recording linear velocity is changed successively or stepwise for continuous recording by using such a control parameter that a change timing of the power level of the laser pulse for recording a mark of 6T or above, when T is a clock cycle of information recorded, is substantially proportional to the recording linear velocity.

23. A writing method as claimed in claim 21 or 22, wherein the control parameter is such a control parameter that the change timing of the front edge or the rear edge of the laser pulse in the laser pulse power level change timings is substantially proportional to the recording linear velocity.

24. A writing method for recording information on an optical disk by applying a laser pulse on a recording layer of the optical disk so as to form a mark,

wherein continuous recording in which the recording linear velocity changes successively or stepwise is performed by using control parameters for respective linear velocities decided by:

a step of recording a first mark having a length not smaller than the laser spot diameter in the

recording layer at a first linear velocity;

a step of recording a second mark having a length equivalent to the first mark at a second linear velocity;

a step of calculating a voltage value change amount at two points at a distance Ts (Ts < Tm/2) in the time axis direction before and after the time position reference Tm/2 from the front edge of an electric signal waveform obtained by reproducing the first or the second mark at a predetermined linear velocity and having a time width Tm; and

a step of deciding a control parameter of the laser pulse power level change timing so that the aforementioned change amount is substantially constant during recording at any of the linear velocities.

25. A writing method for recording information on an optical disk by applying a laser pulse on a recording layer of the optical disk so as to form a mark,

wherein continuous recording in which the recording linear velocity changes successively or stepwise is performed by using control parameters for respective linear velocities decided by:

a step of recording a first mark 6T or above when T is the clock cycle of the information recorded, at a first linear velocity;

a step of recording a second mark having a length equivalent to the first mark at a second linear

velocity;

a step of calculating a voltage value change amount at two points at a distance Ts (Ts < Tm/2) in the time axis direction before and after the time position reference Tm/2 from the front edge of an electric signal waveform obtained by reproducing the first or the second mark at a predetermined linear velocity and having a time width Tm; and

a step of deciding a control parameter of the laser pulse power level change timing so that the aforementioned change amount is substantially constant during recording at any of the linear velocities.